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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/826,733

04/16/2004

Masataka Shinoda

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05/16/2007

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EXAMINER

GOMA, TAWFIK A

ART UNIT

PAPER NUMBER

2627

MAIL DATE

DELIVERY MODE

05/16/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/826,733

Applicant(s)

SHINODA, MASATAKA

Examiner

Tawfik Goma

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-2 and 5-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

This action is in response to the Pre-Appeal Conference request filed on 1/25/2007 and the decision to reopen prosecution sent on 3/12/2007. Please see response to arguments with reference to the use of the same references in this rejection as the prior rejection.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knight et al (US 6243350) in view of Okubo (US 2003/0118936).

Regarding claim 1, Knight discloses an optical recording medium recorded and reproduced with irradiation of light thereon, said irradiation of light being made by an objective lens of which numerical aperture is larger than 1 to record and reproduce recorded pits (col. 35 lines 57-63, NA=NA of Objective lens (.65) x Refractive index of SIL (2) = 1.3), comprising at least a recording layer and a silicon oxide layer being formed from the light irradiation side, in that order (col. 37 line 12). Knight further discloses wherein said recording layer has formed thereon a protective layer of which refractive index is larger than a numerical aperture of said objective lens (SiN, col. 37 line 12 and lines 3-6). Although Knight discloses that the any write-once, or phase change material can be used as the recording layer, he fails to disclose a silicon recording layer. In the same field of endeavor, Okubo discloses a recording medium

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with a silicon recording layer (par. 83). It would have been obvious to one of ordinary skill in the art to use a silicon recording layer as taught by Okubo in the recording medium taught by Knight. The rationale is as follows: One of ordinary skill in the art would have been motivated to use a silicon recording layer as a suitable write-once recording material since Knight (col. 29 lines 44-67) suggests using any suitable write-once recording material and Okubo teaches that silicon is a suitable write-once material.

Regarding claim 2, Knight in view of Okubo disclose everything claimed as applied above. Further in regard to claim 2, it is known that silicon is oxidized when irradiated by a recording laser, and pits are formed by changing silicon to silicon-oxide by the recording laser. .

Regarding claim 5, claim 5 is rejected for the same reasons as claims 1 and 2 above.

Regarding claims 6 and 7, Okubo discloses using a protective layer (5, fig. 4) made of Ta<sub>2</sub>O<sub>5</sub> (par. 85). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the recording medium disclosed by Knight by substituting a protective layer made of Ta<sub>2</sub>O<sub>5</sub> as taught by Okubo. The rationale is as follows: One of ordinary skill in the art at the time of the applicant's invention would have been motivated to provide a protective layer made of Ta<sub>2</sub>O<sub>5</sub> as a well known protective layer material commonly used in the art. The refractive index of Ta<sub>2</sub>O<sub>5</sub> is known to be greater than 2 for wavelengths used during recording which would be greater than the numerical aperture of the objective lens used by Knight (1.3).

***Response to Arguments***

The pre-appeal conference request resulted in the decision to reopen prosecution based on an incorrect assumption of the method of calculating the effective Numerical Aperture of a system. The applicant presented arguments which in part centered around the premise that the Numerical Aperture is calculated by adding the NA of the objective lens with the refractive index of the SIL (Silicon Immersion Lens) (see applicant's arguments page 3, 3rd paragraph continued through page 4 lines 1-2). This assertion by applicant is incorrect because it has come to the examiner's attention that the effective numerical aperture of such a system is computed by taking the product of the Numerical Aperture of the objective lens and the refractive index of the SIL (See for example; Jain US 6061322 col. 6 lines 34-42). As a result, and in view of this new evidence, Knight specifically discloses a system where the effective NA is equal to 1.3 (see col. 35 lines 57-62) and wherein a protection layer composed of SiN has a refractive index equal to 2.07 (col. 35 line 65). Therefore, this disclosure overcomes applicant's argument that the examiner has combined a broad teaching of NA greater than 1, with a specific disclosure of the refractive index of the index of refraction. Applicant's remaining arguments will also be addressed below.

With respect to applicant's argument that the SiN coating is formed on the SiO<sub>2</sub> dielectric and not on the recording layer 3002, this argument is not persuasive because in the same embodiment discussed above Knight discloses wherein the structure would place the SiN recording layer directly on the recording layer (col. 37 line 12). The structure disclosed is SiN/Mo/(SiO<sub>x</sub>/SiN)/Al/Substrate which reads on the claim.

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With respect to applicant's argument that the references fail to show a motivation to combine, this argument is not persuasive because Knight clearly discloses that any write-once, or phase change material can be used as the recording layer (col. 29 lines 49-67), and Okubo discloses using Silicon as a suitable write-once recording layer. The argument that the combination of Okubo and Knight would not function lacks any evidence or reasoning as to why the combination would not function. Applicant asserts that the thickness of the substrate in Okubo would cause the combination not to function, however, nowhere in Okubo does the reference limit the use of a Silicon recording layer to a particular thickness of substrate, and Okubo even discloses wherein the substrate thickness is variable from .3 mm to 1.2 mm (par. 72). Finally, applicant's argument that Okubo's disclosure of placing the Si layer directly on the substrate as the most desirable structure because of its simplicity is a showing of the reference teaching away is not persuasive for two reasons. First Okubo's disclosure that the particular structure is desirable due to simplicity does not teach away from a different structure, and does not show that a different structure may not also be desirable and feasible. Secondly, the references are only combined to show that the Silicon can be used as a suitable recording layer, and the structure of the disk is fully disclosed in Knight.

### ***Conclusion***

Since the examiner has changed his position with respect to the disclosure in the previously cited references, this action is a Non-Final rejection.

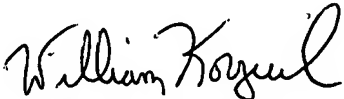
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tawfik Goma whose telephone number is (571) 272-4206. The examiner can normally be reached on 8:30 am - 5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tawfik Goma/  
T. Goma  
5/10/2007

  
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